

### **REMARKS**

Claims 26-35, 37-43, 46-55, 97 and 99 are pending in the application, with claims 26, 27, and 37-40 being currently amended, and previously pending claim 36 being cancelled.

Independent claim 26 has been amended by incorporating therein the subject matter of now cancelled dependent claim 36. More specifically, claim 26 now recites a method of bonding rubber to a metal substrate which includes, in part, applying a silane solution comprising a substantially hydrolyzed bis amino-silane, a substantially hydrolyzed sulfur-containing silane, and a nanosize particulate material to at least a portion of a surface of the metal substrate [underlining for emphasis].

In addition, currently amended dependent claims 27 and 37-40 have been amended to properly depend from independent claim 26.

In the present Official Action, Examiner has newly rejected previously pending claims 26-35, 41-43, and 97 either under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being obvious over previously cited Van Ooij WO 00/63462 ("the '462 application"), Van Ooij U.S. Patent No. 6,416,869 ("the '869 patent"), or Van Ooij U.S. Patent No. 6,756,079 ("the '079 patent") (collectively, "the Van Ooij references"). In addition, Examiner further newly rejects dependent claims 36-40, 46-55, and 99 as being unpatentable over the any of the Van Ooij references in view of previously cited Shimakura U.S. Patent No. 6,475,300, ("Shimakura"). Finally, all previously pending claims appear to stand newly rejected on the grounds of nonstatutory obviousness-type double patenting as being

unpatentable over the combined limitations of claims 7-19, 24-31, and 33 of the '079 patent in view of Shimakura.

Insofar as Examiner continues to separately base the various §102 and §103 rejections on the Van Ooij references, Applicants continue to submit that these rejections are impermissibly duplicative. Such rejections at least create a needless and improper burden on Applicant by having to respond to each of the rejections. Surely, Examiner is aware that in selecting references to be cited in an Official Action, he is not called upon to cite *all* references that may be available, but only the "best." Indeed, "multiplying references, any one of which is as good as, but no better than, the others, adds to the burden and cost of prosecution and should therefore be avoided" [underlining for emphasis]. See MPEP §904.0.3. Upon even a cursory reading of the Official Action, it is clearly evident that the individual rejections, as based on each Van Ooij reference, are essentially identical. In support thereof, it is specifically pointed out that the '079 patent, in fact, is a divisional application of the '869 patent, while the '462 application specifically claims priority to the '869 patent. This lends real credence to the position that these rejections are needlessly and impermissibly duplicative. Yet, each reference, time and time again, continues to be individually relied upon for separate rejections. In addition, such multiplication necessarily increases the time devoted to this case by the Office, which has the effect (albeit it slight with regards to a single case) of unnecessarily adding to the significant backlog of cases – the very thing that the Office is exhaustively trying to rectify. In view thereof and for any future Official Actions (if so occurring), Applicants kindly request that Examiner avoid the improper multiplication of references in any rejections.

### **Duplicative §102 and §103 Rejections Based on the Van Ooij References**

In the Official Action, Examiner asserts that each of the Van Ooij references disclose the instantly claimed metal substrate, silane solution, and sulfur cured rubber, as well as the same coating parameters, including concentration of the silane solution and length of contact time between the solution and the metal. In view thereof, Examiner alleges that the methods in the Van Ooij references would have inherently provided a coating thickness in Applicants' claimed ranges. Otherwise, the methods in the Van Ooij references allegedly would have rendered the invention obvious because the methods yield a composite material featuring improved adhesion characteristics between a metal substrate and a sulfur-cured rubber. *See* Official Action, page 9, for example. While Applicants disagree with the rejections, in an effort to move this case to conclusion, Applicants have amended independent claim 26 (and 46) so as to render the rejections moot. Because independent claim 46 more narrowly defines the method of bonding rubber to a metal substrate, the remarks herein will focus on independent claim 26 (with specific mention of independent claim 46 where thought to be useful), but without waiver or right to present additional arguments, including as directed to one or more of the dependent claims should that become necessary.

It is well established that "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Indeed, for the following reasons, the Van Ooij references clearly fail to

teach each and every element of Applicants' method of bonding rubber to metal as recited at least in currently amended independent claim 26 (and 46).

Again, as discussed above, Applicants' independent claim 26 now calls for a method of bonding rubber to a metal substrate which includes, in part, applying a silane solution comprising a substantially hydrolyzed bis amino-silane, a substantially hydrolyzed sulfur-containing silane, and a nanosize particulate material to at least a portion of a surface of the metal substrate. In the Official Action, Examiner already acknowledges that the teachings of the Van Ooij references are silent regarding the presence of a nano-size particulate material in the silane solutions. In an effort to fill that teaching void, Examiner resorts to Shimakura. See Official Action, page 18. Because currently amended independent claim 26 requires nano-size particulate material, the rejections of independent claim 26 (and 46), and its dependent claims, as being anticipated or unpatentable over each of the Van Ooij references is overcome. Thus, those rejections must be withdrawn.

**Duplicative Obviousness Rejections based on the Van Ooij References and Shimakura**

Concerning the obviousness rejections of dependent claims 36-40, 46-55, and 99 based on the combination of the Van Ooij references and Shimakura, in the Official Action, Examiner asserts that Shimakura discloses a corrosion resistant silane-based intermediate (primer) layer for metal substrates (Abstract; column 2, lines 29-32). Shimakura further discloses that the metallic surface-treatment agent includes water-dispersible silica, e.g., colloidal silica such as Snowtex N. The water-dispersible silica allegedly is formulated in a specified concentration so as to provide enhanced corrosion resistance. To that end, Examiner alleges that Shimakura

demonstrates that nano-size silica is recognized in the art as a suitable inert additive for silane based primers, providing enhanced corrosion-resistance properties to primers; and that the concentration of the silica nano-particles is a result effective variable. Thus, Examiner concludes that it would have been obvious to provide silica nano-particles in an optimized concentration range, as taught by Shimakura, in the solutions of the Van Ooij references to provide enhanced corrosion-resistance properties to the primer. *See* Official Action, pages 18 and 19. Applicants respectfully disagree.

Upon review of Shimakura, this reference appears to be directed to a non-chromate metallic surface treating agent which requires (a) a silane coupling agent and/or a hydrolytic condensation product thereof, (b) water-dispersible silica, and (c) a zirconium compound and/or a titanium compound, and optionally (d) a thiocarbonyl-containing compound and/or (e) a water-soluble acrylic resin. The metallic surface treating agent allegedly is suited to the treatment of metals and is capable of imparting excellent processability and corrosion resistance to the substrates without enlisting the help of chromium. The water-dispersible silica, as acknowledged by Examiner, is understood to enhance corrosion resistance of the surface treating agent. Indeed, the corrosion resistance of the water-dispersible silica allegedly is insufficient if it is present above or below a specified concentration in the surface treating agent. And, while topcoats may be bonded to the metal substrates treated with surface treating agent in Shimakura, glaringly absent as a topcoat option is rubber. Rather, Shimakura revolves around primers such as for paint, not rubber topcoats. *See, e.g.*, abstract; col. 3, lines 31-40; and col. 6, lines 27-31.

Surely, Examiner is aware that a *prima facie* showing of obviousness is satisfied only if there is an apparent reason to combine the prior art references flowing from either the references, the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved, and the results are expected. *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740 (2007); *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). In the instant case, Examiner has failed to establish a *prima facie* case of obviousness for the reasons that follow below.

Briefly, by way of background, Applicants' invention was motivated by a desire to improve the adhesion, or bonding, of sulfur-cured rubber to a metal substrate using a silane solution. The improved and unexpected adhesion came in the form of a nanosize particulate material, e.g., silica, which is mixed with a substantially hydrolyzed bis amino-silane and a substantially hydrolyzed bis sulfur-containing silane to provide the silane solution. *See, e.g.*, paragraphs [0001], [0003], [0013], [0022], [0024], and [0039] of the application. Such silane solution effectively adheres the sulfur-cured rubber to the metal substrate upon curing thereof. Clearly, Applicant's claimed method is not at all directed to, or focused on, enhancing corrosion resistance, but rather bonding or adhesion, which is in stark contrast to Examiner's corrosion resistance rationale for looking to and combining the silica material of Shimakura with the methods of the Van Ooij references.

To that end, rather than actually focusing on bonding, in particular, Applicants' method of bonding rubber to a metal substrate by the addition of nanosize particulate material to the silane solution, Examiner chooses instead to focus on corrosion resistance. Thus, at the outset, Applicants submit Examiner's obviousness rejection is in trouble. Indeed, as explored

further below, Examiner's obviousness rejections, which rely on enhanced corrosion resistance as the reason for selecting silica and combining it with the methods of the Van Ooij references, are wrong. Instead, Examiner's rationale is nothing more than a red herring and a blunderbuss attempt to justify the random picking and choosing of Shimakura's silica component from amongst the other required components of its surface-treating agent.

Admittedly, Applicants are confused as to why one of ordinary skill in the art would actually look to enhance the corrosion resistance of the silane solutions in the Van Ooij references by adding the Shimakura silica component thereto. It is clearly evident from even a cursory reading of the Van Ooij references that the silane solutions therein already possess superior corrosion resistance. In fact, the inventors of the Van Ooij references purposefully set out to accomplish just that, *i.e.*, to provide a silane solution that provides superior corrosion resistance when utilized on metal substrates for bonding rubber (and non-rubber) coatings thereto. And, they were successful in their exploits. *See, e.g.*, col. 1, lines 7-11; col. 5, lines 7-14; col. 8, lines 52-65; col. 9, lines 24-33 and 42-52; and the Examples of the '869 patent. Indeed, the silane solutions worked for their intended purpose, and do not at all demand or require enhanced corrosion resistance. Thus, it simply is counterintuitive to add something when it is not at all needed. In view thereof, there is no apparent reason to incorporate Shimakura's silica material into the methods of the Van Ooij references.

Further to that end, the Van Ooij references are very clear about the uncertainties and unpredictabilities that revolve around silane chemistries and rubber to metal bonding versus non-rubber to metal bonding. In particular, it is unrealistic that the same successes or observed

characteristics, e.g., enhanced corrosion resistance, of a silane solution used in paint (non-rubber) applications will be observed when that solution is used in rubber applications. *See, e.g.*, page 2, lines 29-32 of the '462 application; col. 2, lines 51-60 of the '869 patent; and col. 2, lines 56-65 of the '079 patent. As such, because of those uncertainties, it is unreasonable for Examiner to conclude that the silica component, which is utilized in Shimakura in metal to non-rubber bonding applications only, will be equally effective (if at all) in metal to rubber bonding applications.

And, even at best, if one were to actually go so far as to incorporate the Shimakura silica into analogous methods of the Van Ooij references, which we submit one would not, the resulting method still would fail to involve bonding rubber to metal, as required by independent claim 26 (and 46). Rather, the result would be a method involving metal substrates and non-rubber bonding. Indeed, as mentioned earlier, Shimakura concerns itself with bonding topcoats, i.e. paint (NOT rubber), to metal substrates. *See, e.g.*, abstract; col. 2, lines 46-67; col. 5, lines 51-58; col. 6, lines 5-14 and 39-46, and the Examples. The corrosion resistance enhancing effect of the Shimakura silica clearly is not at all taught to be effective for bonding rubber to metal. And, Examiner simply chooses to ignore this fact. Because Shimakura teaches non-rubber to metal bonding, why would one combine the silica of this reference with the rubber bonding methods of the '462 application, the '869 patent, or the '079 patent to provide Applicants' claimed methods of bonding rubber to metal? The answer -- one would not but for the information gleaned from Applicants' own specification. And, this is impermissible hindsight reconstruction, which is fatal to a §103 rejection.

Accordingly, in view of all of the above, it is respectfully submitted that Examiner



has failed to establish a *prima facie* case of obviousness. Thus, the rejections of independent claims 26 (and 46), and its dependent claims, as obvious are in error and should be withdrawn.

#### **Non-Statutory Obviousness-Type Double Patenting Rejections**

Finally, as stated above, Examiner continues to reject all pending claims based on non-statutory obviousness-type double patenting. In particular, all of the claims stand rejected on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over the combined limitations of claims 7-19, 24-31, and 33 of the '079 patent in view of Shimakura.

A double patenting rejection of the obviousness-type, if not based on an anticipation rationale, is "analogous to [a failure to meet] the nonobviousness requirement of 35 U.S.C. 103" except that the patent principally underlying the double patenting rejection is not considered prior art. *In re Braithwaite*, 379 F.2d 594, 154 USPQ 29 (CCPA 1967). Therefore, the analysis employed in an obviousness-type double patenting rejection parallels the guidelines for analysis of a 35 U.S.C. 103 obviousness determination. *In re Braat*, 937 F.2d 589, 19 USPQ2d 1289 (Fed. Cir. 1991); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985). As can be plainly seen from a reading of the Official Action, Examiner has generally regurgitated the obviousness arguments based on the '079 patent in view of Shimakura and relabeled them as obviousness-type double patenting rejections. These relabeled rejections are equally as flawed as Examiner's obviousness rejections for the reasons stated above. Thus, it is submitted that Applicant's methods are not an obvious variation of any of claims 7-19, 24-31, and 33 of the '079 patent in view of Shimakura. Accordingly, Applicants respectfully submit that the rejections based on non-statutory obviousness-type double patenting are in error and must be withdrawn.

### Conclusion

As a result of the remarks given herein, Applicants submit that the rejections of the pending claims have been overcome. Therefore, Applicant respectfully submits that this case is in condition for allowance and requests allowance of the pending claims.

If this Response leaves any issues open or the Examiner wishes to discuss any further issues, a call to undersigned counsel would be gratefully appreciated. Applicants also have submitted all fees believed to be necessary herewith. Should any additional fees or surcharges be deemed necessary, the Examiner has authorization to charge fees or credit any overpayment to Deposit Account No. 23-3000.

Respectfully submitted,  
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